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Vol. V JULY, 1911 No. 7

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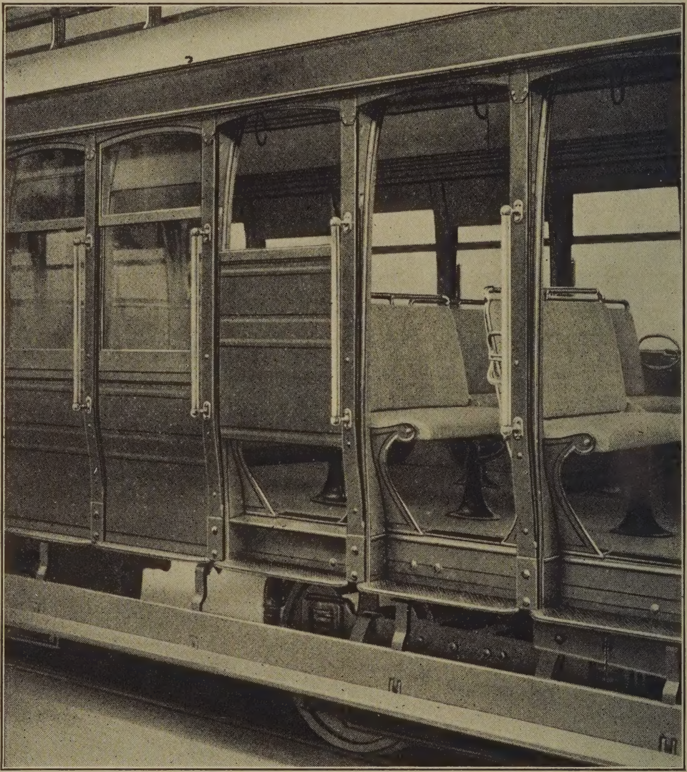
BRILL MAGAZINE

Church Street
Liverpool, England



THE BRILL CONVERTIBLE CAR

(Patented)

The window system is practically the same as in the Brill Semi-Convertible Car. Both panels and sashes slide into roof pockets. The sliding panels are made of two sheets of thin steel with air space between. The "Narragansett" Sill Step (patented) reduces the step heights of double-truck cars and does not alter the interior nor exterior width of the car.

THE J. G. BRILL COMPANY

PHILADELPHIA - - - PENNSYLVANIA

BRILL MAGAZINE

Vol. V JULY, 1911 No. 7

JOHN BLAIR MACAFEE

[WITH PORTRAIT INSERT]

JOHN BLAIR MACAFEE, organizer and manager of electric railway properties, was born July 4, 1861, at St. John, New Brunswick. He has lived in Philadelphia since childhood and is a graduate of the University of Pennsylvania and a member of the Philadelphia bar. He practiced law till 1892, when he became identified with public utilities and studied engineering. As president of the Riarton Construction Co., he built electric railways in New Jersey and was president of a line between Plainfield, Riarton, Bound Brook and New Brunswick. He became the president of the American Engineering Co., and built the Newton Electric Railway (Pa.), the Elmira & Seneca Lake Railway (N. Y.), and the Michigan Traction lines from Kalamazoo to Battle Creek and later was vice-president and general manager of the Railways Company General. In 1899 he built the Ohio River Electric Railway & Power Company's system and was identified with the building of the New Orleans & Pontchartrain Railway. Then followed the building of the Augusta & Aiken Railway, and, becoming president of that company, also controlled the Augusta & Georgia Railway & Light Co., and the Hampton Terrace Hotel & Land Co., which were under the same ownership. He also built the Blue Grass Traction Company's lines. Mr. McAfee is now president of the following electric railway companies: Norfolk & Portsmouth Traction, Pomeroy & Middleport, Central Kentucky Traction, Blue Grass Traction and Lexington Railway. He is vice-president and general manager of the Ohio River Electric Railway & Power Co., and president of the Lexington Utilities Co.

CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE

LIVERPOOL*

LIVERPOOL, the second maritime city of the British Empire, is situated on the west coast of England, near the mouth of the River Mersey, long famous for its great shipping and ship-building industries. Its convenient geographical location for transatlantic travel, together with harbor and dock facilities that can scarcely be equaled, has made it one of the first maritime cities of the globe. Although given a population in excess of 700,000, its municipal boundaries comprise less than 24 square miles—a striking contrast to the extended area so characteristic of American cities. Across the Mersey, and directly opposite Liverpool, lies Birkenhead, a famous ship-building city of more than 120,000 inhabitants with which Liverpool is connected both by river ferries and by an electric railway tunnel.

Liverpool is pre-eminently a commercial city, the value of her export trade alone for the year ending July 1, 1909, having been $726,000,000. A magnificent landing stage, nearly half a mile long and 80 feet wide, connected with the shore by means of nine bridges, affords perfect facility for the enormous transatlantic traffic of the port, although the average rise and fall of the tide is 11 feet, while the spring tides sometimes reach 30 feet. It is here that the huge ocean liners, as well as most of the numerous passenger steamers plying on the Mersey, dock. This section of Liverpool is known as the Pier Head and constitutes the traffic center of the city.

Within a radius of a mile of the Pier Head are located all of the great trunk line railway termini, public buildings,

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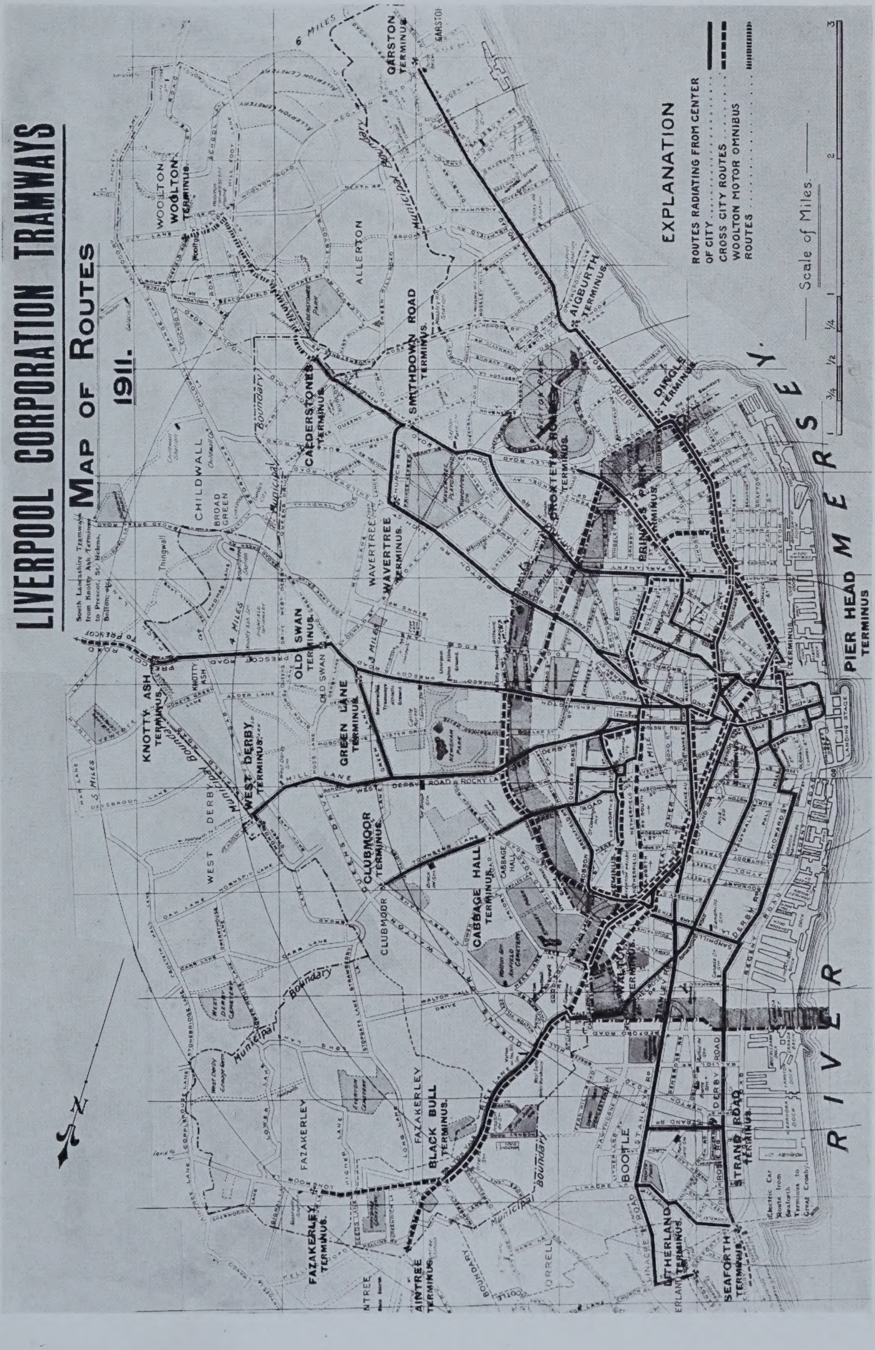
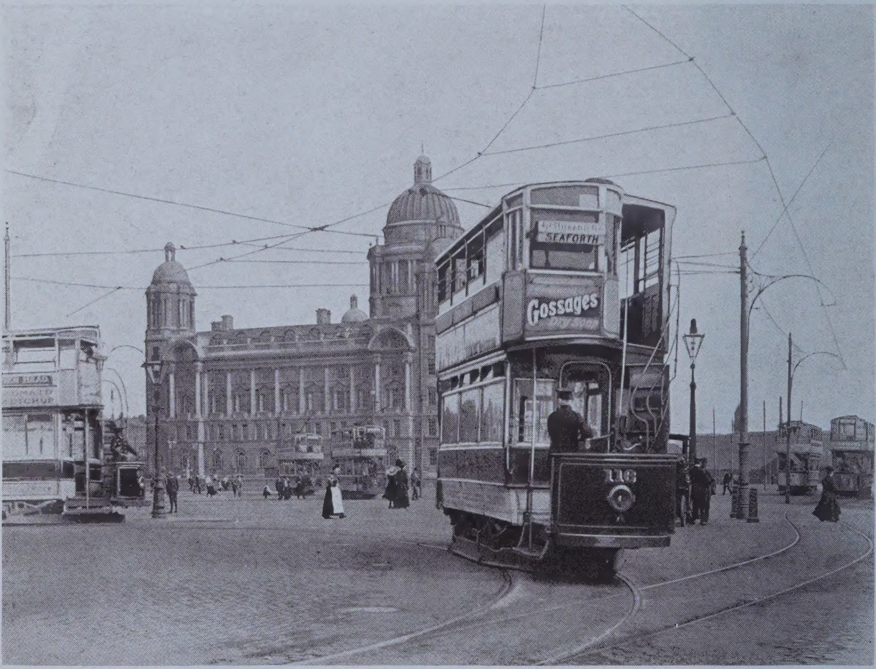
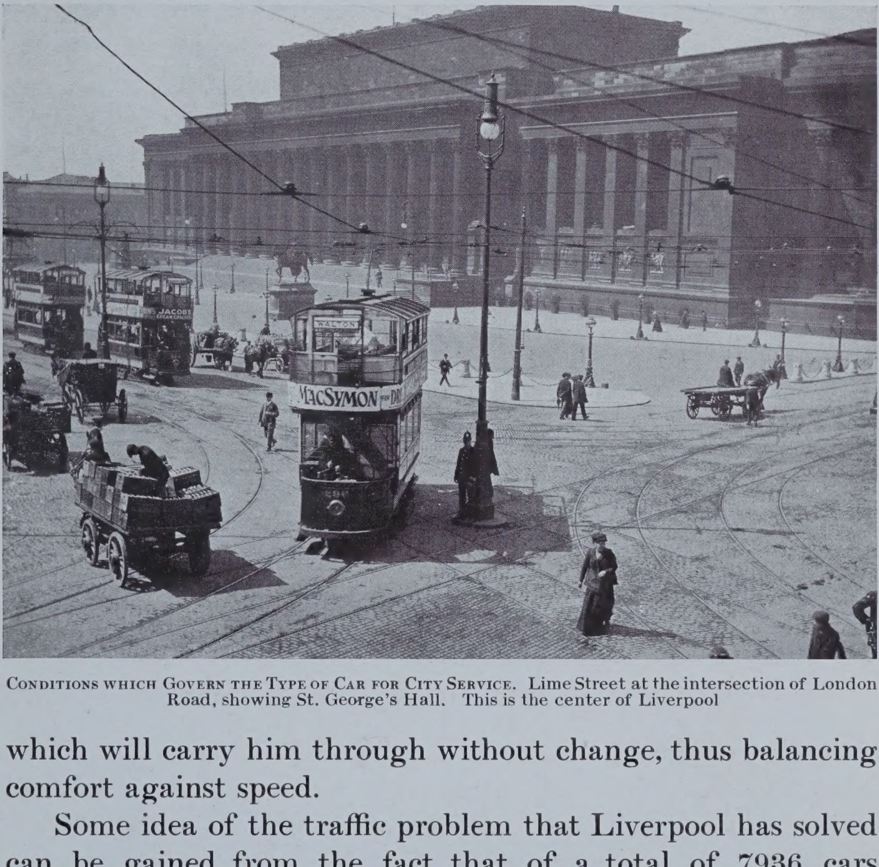
* The thirty-first article of this series.


LIVERPOOL CORPORATION TRAMWAYS
Map of Routes
1911.
EXPLANATION
ROUTES RADIATING FROM CENTER OF CITY
CROSS CITY ROUTES
WOOLTON MOTOR OMNIBUS ROUTES
Scale of Miles.
RIVER MERSEY.
PIER HEAD TERMINUS
WOOLTON TERMINUS
GARSTON TERMINUS
AIGBURTH TERMINUS
DINGLE TERMINUS
SMITHDOWN ROAD TERMINUS
CALDERSTONES TERMINUS
SEFTON PARK TERMINUS
PRINCES PARK TERMINUS
WAVERTREE TERMINUS
OLD SWAN TERMINUS
GREEN LANE TERMINUS
KNOTTY ASH TERMINUS
WEST DERBY TERMINUS
CLUBMOOR TERMINUS
CABBAGE HALL TERMINUS
WALTON TERMINUS
BLACK BULL TERMINUS
FAZAKERLEY TERMINUS
AINTREE TERMINUS
BOOTLE
STRAND ROAD TERMINUS
SEAFORTH TERMINUS
LITHERLAND TERMINUS
ALLERTON
CHILDWALL
BROAD GREEN
WEST DERBY
FAZAKERLEY
Municipal Boundary
South Lancashire Tramways from Knotty Ash Terminus to Prescot, St. Helens, Bolton, etc.
Electric Car Route from Seaforth Terminus to Great Crosby.

large commercial houses and leading hotels. This small and therefore extremely congested business center has presented a traffic problem of peculiar difficulty for the Liverpool transit lines. Here, within a most restricted area, intersected by a maze of the most irregular streets, many of which are narrow, the majority of the city lines converge in order to carry their passengers to and from the business center. As will be noticed on the accompanying map, nearly the entire railway system radiates from a given point—the Pier Head. These radial routes are intersected by some five cross-town lines which link the radial lines at the principal traffic points and afford access from north to south at varying distances from the center of the city. Although the congestion that naturally results from such a condition at the Pier Head must be most severe, it has been greatly obviated by the oper-



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Pier Head Terminal of the Liverpool Corporation Tramways. Most of the lines radiate from this point ation of through lines, thereby eliminating the transfer of passengers in this district. In the application of this system of internal transportation, local characteristics must be considered. While the American finds little objection to changing cars in order to reach his destination more expeditiously, the Briton, like other Europeans, is willing to wait for the car which will carry him through without change, thus balancing comfort against speed.



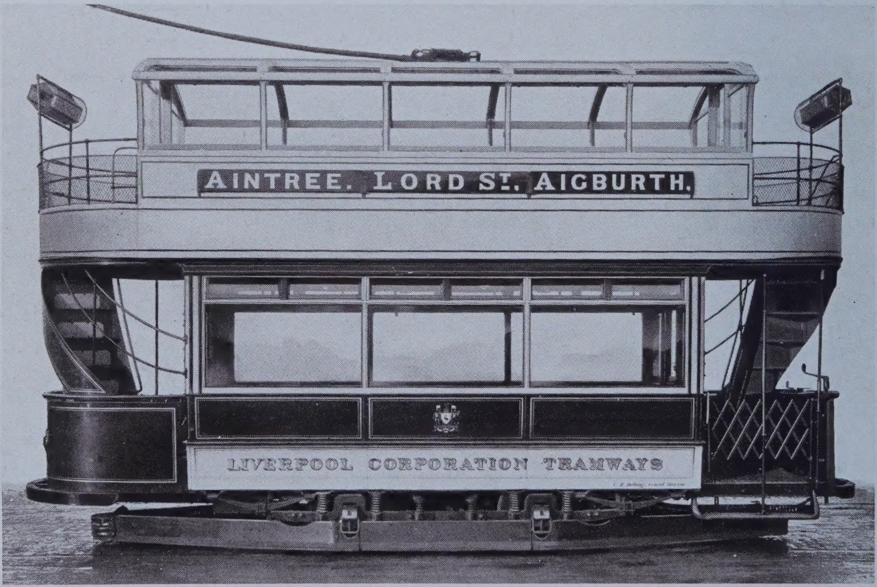
CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Lime Street at the intersection of London Road, showing St. George's Hall. This is the center of Liverpool

Some idea of the traffic problem that Liverpool has solved can be gained from the fact that of a total of 7936 cars running in and out of the city per day in the busy season, 6086, or more than 76 per cent., arrive and leave the Pier Head.

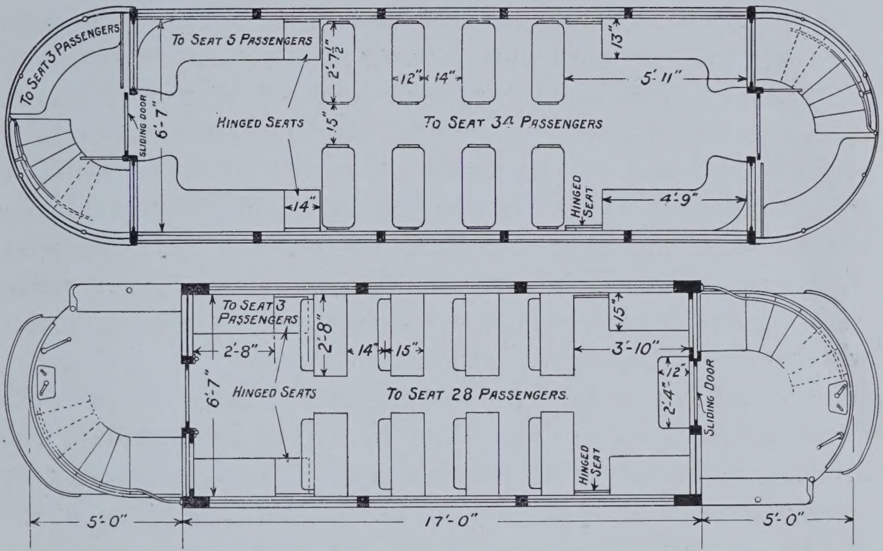
The electric street railways, or, as they are known in England, the tramways, are owned by the Liverpool Municipal

Corporation, which took over the Liverpool United Tramways & Omnibus Company in 1897, when the lines comprised about 67 miles of single track and were operated by horse traction. The lines were at once equipped for the overhead system of electric traction, and the first section was opened for service in November, 1898; and during the following three years the main bulk of the present system of tramways was completed. The total length of track at present operated is 123 miles, consisting of both double and single track routes, the last of which was completed May 18, 1903.

The rolling stock at present consists of some 561 cars, the average number in service being about 450. The standard cars are of the single-truck double deck type, with wheel base ranging from 6 feet to 7 feet 6 inches, the upper deck in the majority of cases being roofed in. The cars provide a seating capacity for 28 on the lower deck and 34 on the upper deck, with a total licensed capacity for 71 passengers, nine standing.



Conditions which Govern the Type of Car for City Service. The standard car of the Liverpool Corporation Tramways. The upper deck is protected in stormy weather by window sashes at the sides and sliding roof panels. The car is mounted on the Brill No. 21-E Truck



Conditions which Govern the Type of Car for City Service. Upper and lower decks of the car shown on the opposite page. The Liverpool cars pass each other on the left side

A movable seat across either sliding door entrance which is not in use provides accommodation for two passengers. As the cars are operated on the left-hand track, they have the entrance and exit at the left and rear on one side only. The front gate is always closed.

The rear step is of sufficient width to admit two, but a heavy brass rod separates the space between them, which prevents crowding. The doors of the cars are only wide enough to admit one person at a time. On the upper and lower decks are signs stating the number of passengers which a deck will accommodate. The conductors become proficient in estimating the number of persons who have boarded a car, and when filled the iron gate is closed, indicating that there is no more room for passengers.

Until 1908, the cars were of one uniform type, when an experiment was made with what are termed "first-class" cars, which showed the advisability of reserving only the inside of the cars for first-class passengers, the upper deck being utilized for passengers at the usual prices. It is understood that this system has become so satisfactory that applications have been received for its extension to all lines.

The majority of the cars are mounted on Brill No. 21-E trucks and equipped with two 25 h. p. motors, but the later type of cars are equipped with two 35 h. p. motors. The weight of these cars is 21,160 pounds unloaded. In addition to the cars, there is the usual complement of store cars, snow sweepers, etc, The rolling stock is at present housed in six car sheds situated in the various suburbs.

The lines have been constructed by the corporation's own staff, under direction of the city engineer. The rails, of standard gage, are laid on foundations of Portland cement concrete at least six inches in thickness, and are of the grooved girder pattern, weighing from 95 to 123 pounds per yard. The grades on the Liverpool lines are not severe, the steepest being about seven per cent., and the sharpest curve has a radius of 40 feet.

The overhead equipment consists of center poles, span wires with poles and rosettes and side bracket arms. The conductors are mainly .409-inch diameter and the main junctions are now largely equipped with automatic frogs.

The car building and maintenance works are situated at the north end of the city and cover an area of some 13,000 square yards, with a staff of about 430 men, including a building department staff which deals with the maintenance and minor alterations of buildings. The whole of the repair work for the cars is carried out at these works, the car sheds being utilized for storing, cleaning and examining only.

The capital that has been expended on the Liverpool electric tramways to the 31st of December, 1910, was $9,932,655 and the total revenue for the year, $2,977,765. The net profit, after having provided for interest and sinking fund, was $491,330. The car mile earnings for 1910 amounted to 22.84 cents and the total charges to 20.264 cents per car mile. The average fare per passenger was 2.212 cents and the average length of the two-cent stage is about 2½ miles. Since the inauguration of the undertaking by the Liverpool City Corporation, the sum of $2,841,115 has been transferred to the reserve, renewal and depreciation accounts in addition to the provision for interest and sinking fund and the sum of $1,338,630 has been transferred to the city treasury.

It will be interesting to note that in 1897, the last year of complete horse traction, the maximum number of passengers was 3,700,000 as against 9,600,000, the maximum number of passengers carried in 1901, the first year of complete electric traction in Liverpool, while the maximum number carried during 1910 was 11,300,000. In addition to the surface lines, there is an elevated electric railway which skirts the bank of the Mersey, furnishing a convenient means of traversing the dock district.

A number of the surface lines radiating from the Pier Head have connections at their termini with lines extending into the country about Liverpool. These suburban lines furnish excellent means of communicating with the outlying districts of the city and nearby towns. The fares charged on all these suburban routes are low; for instance, the total fare from Pier Head to Garston and return, a ride of 23½ miles and occupying about 2½ hours, is 22 cents; the fare from Pier Head to West Derby and return, a ride of 9 miles and occupying about 1¼ hours, is 8 cents; and the excursion from Liverpool to St. Helen's, a ride of 17½ miles, is made for 24 cents.

The outer circular belt route, which may be distinguished on the map, circumscribing the city, traverses a distance of 8 miles, upon which a fare of 8 cents is collected. This route carries one through representative sections of the whole city, thus affording a general view of the city and some of its suburbs, returning the passenger to the starting point.

All of the material and photographs from which this article has been prepared were obtained through the courtesy of Mr. C. W. Mallins, A. I. E. E., general manager of the Liverpool Corporation Tramways.

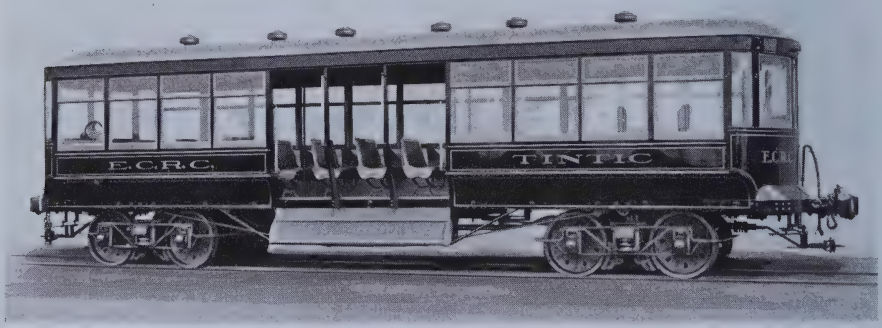
CLOSED TRAIL CARS FOR THE EMIGRATION CAÑON RAILWAY, UTAH

CENTER ENTRANCE

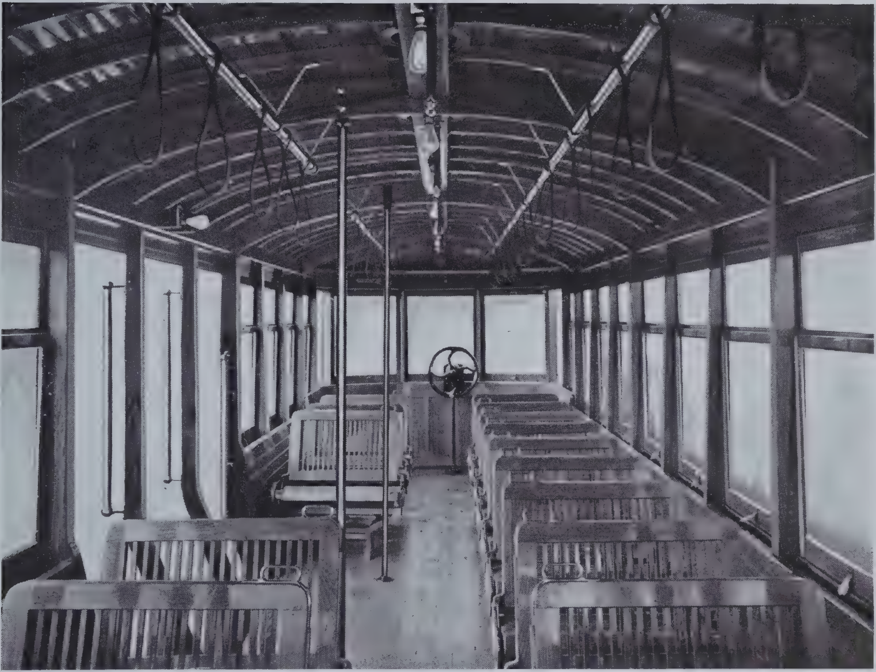
NEW closed trail cars have recently been added to the rolling stock of the Emigration Cañon Railway Company, Salt Lake City, to be used in its regular transit service. These cars are very similar in appearance and design to the type of trail car that is operated by the Denver City Tramway Company. Although its design differs from the types in common use by its center entrance feature, Denver, where they have been used for a number of years, reports that they have afforded entire satisfaction.

The center entrance has a width of 8 ft. 2 in. in all. This extra width over that of the motor car entrance is given the trailer entrance with a view of facilitating the loading and unloading, so that when stops are made, passengers on the trail car will not delay the starting of the train. The seating capacity of this type of trailer is 48 passengers, and when equipped with hand and air brakes, the car complete weighs but 9000 lbs.

As will be noticed on the accompanying illustration, the



Closed Trail Cars for the Emigration Canon Railway, Utah. 48-passenger trail car with body weighing only 9000 lbs. Mounted on Brill No. 57-D Trucks



Closed Trail Cars for the Emigration Canon Railway, Utah. The upper sashes are stationary and the lower sashes drop into wall pockets. The single wide side entrance is protected with heavy duck curtains

extreme lightness of this car body has not been obtained by sacrificing any important structural members, but rather by carefully trimming all useless materials until there remained a mechanical structure of accepted design suitable for carrying the desirable number of passengers with the lowest possible dead weight per passenger. Also, this center entrance has the effect of distributing the passengers more evenly throughout the car, thus greatly expediting the process of loading and unloading.

The mild and equable climate with which this territory is favored, together with other local conditions, makes this an ideal type of trail car for this system. The line traverses a territory which attracts many tourists throughout the year, and it also carries many local residents who make their summer homes along the route.

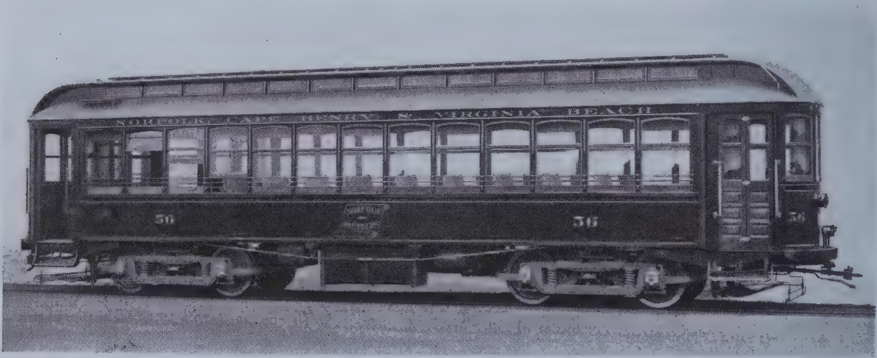
The principal dimensions and weights of these cars are as follows:

Length over ends	37 ft. 0⅜ in.
Centers of side posts	2 ft. 8⅞ in.
Width over sills, including sheathing	7 ft. 3¾ in.
Width over posts at belt	8 ft. 2 in.
Extreme width	8 ft. 6 in.
Height track to under side of side sills	3 ft. 3½ in.
Height from floor to center of head lining	7 ft. 5½ in.
From track to step	0 ft. 16½ in.
Seating capacity	48
Type of trucks	Brill No.57-D
Wheel base	4 ft. 6 in.
Diameter of wheels	0 ft. 33 in.
Weight of car body	9,000 lbs.

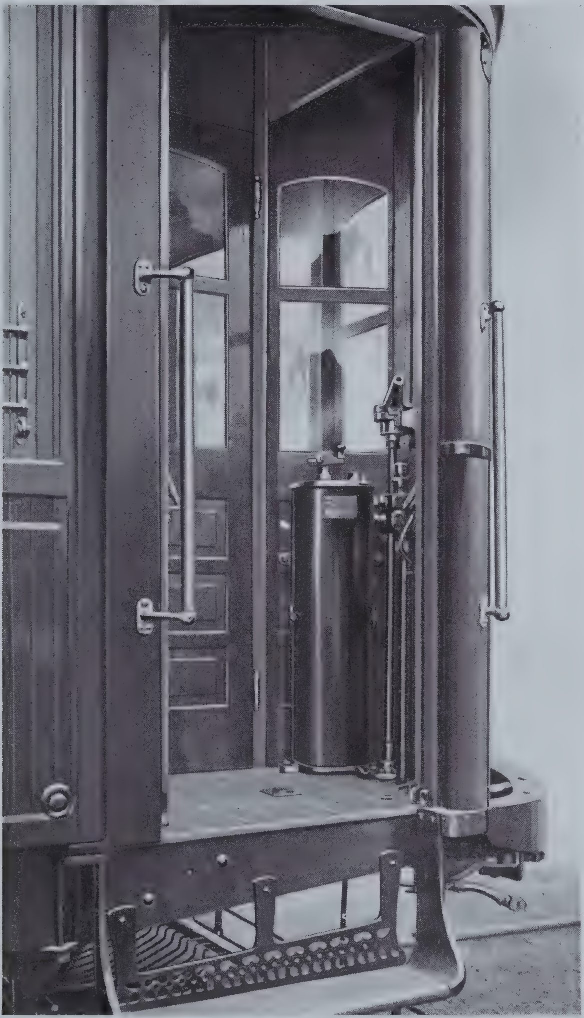
INTERURBAN CARS FOR THE NORFOLK & SOUTHERN RAILROAD

BRILL No. 27-M. C. B. TRUCKS

FOUR handsome combination passenger and smoking cars of the Brill semi-convertible type have recently been built by The J. G. Brill Company for the Norfolk & Southern Railroad. These new cars have every convenience which this type of car makes possible, such as roomy seats, arm rests on the low window sills, a wide aisle, etc. They are equipped with controllers of type M, multiple unit system, and are intended for double-end operation, as both entrance and exit



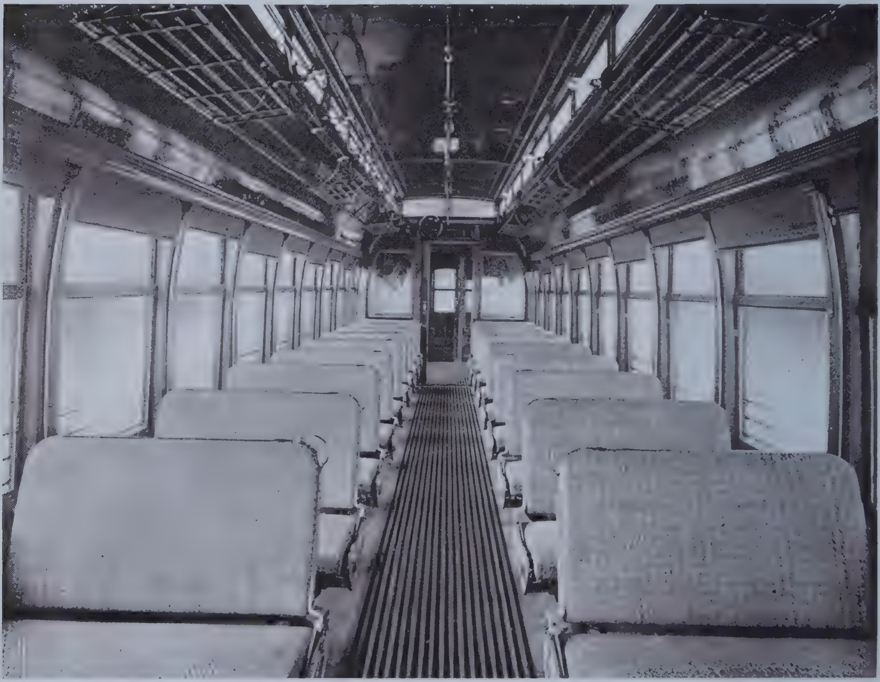
INTERURBAN CARS FOR THE NORFOLK & SOUTHERN RAILROAD. The cars have the Brill Semi-Convertible window system and are mounted on Brill No. 27-M. C. B. Trucks



INTERURBAN CARS FOR THE NORFOLK & SOUTHERN RAILROAD. The cars are equipped for train operation. A motorman's cab is formed by a partition with door which divides the platform

may be had from either platform; however, only one side of the front platform can be used for this purpose, as the motorman's cab prevents passengers from using the right hand step to this platform. The motorman's cab has been placed on each platform at diagonal corners of the car. Each platform has folding vestibule doors and the motorman's compartment is formed by a partition extending longitudinally from the center of the end sill, the length of the swinging door, which in itself constitutes the longitudinal portion of the partition. From this point the partition is carried at an angle to the post between the first and second windows on the right hand side of the dasher. This gives the motorman exclusive use of the right hand window. The door may be swung to the front and secured, thereby completely housing the controlling apparatus when not in use.

The smoking compartment is equipped with longitudinal seats, which, like the transverse seats in the other compartment, are of Brill manufacture. Hand poles, complete with hand straps, extend the full length of the smoking compartment on each side of the car. The compartments are separated by a wood and glass partition in which there is a single sliding door.



Interurban Cars for the Norfolk & Southern Railroad. The passenger compartment seats 40 and the longitudinal seats in the smoking compartment accommodate 12

The body corner posts are of white oak 3⅝ in. thick and the side posts are of the same material, 3¼ in. thick. The bottom framing has side sills 4 in. by 7¾ in. plated with 15 in. by ⅜ in. steel; the end sills are 5¼ in. by 6⅞ in. and the crossings are 4½ in. by 5½ in. The roof is of the clerestory pattern, extending over the hoods in steam car style, with 14 ventilator sashes on each side. The roof is strengthened with concealed steel rafters ⅝ in. thick which are forged to the shape of the roof in a solid piece. There are nine transverse seats 37 in. long on each side of the passenger compartment and two longitudinal corner seats. The window rods on each side of the car are hinged to drop down. A switch cabinet lined with transite is placed on the bulkhead outside of the smoking compartment.

The Brill No. 27-M.C.B.1 trucks have standard A.E.R.A. E.B.1 axles, 5½ in. in diameter at motor bearings, 6 in. at gear seat and $5\frac{15}{16}$ in. at wheel seat. The wheels have a tread of 3½ in. and the flange is 1 in. by $\frac{15}{16}$ in. Both motors on each car are mounted on one truck, this truck being placed underneath the smoking compartment. The trailer truck, however, has suspension bars, etc., for the accommodation of motors if desired.

The points reached by this line, Cape Henry and Virginia Beach, indicate a large excursion business, and it is probably on this account that this type of car was chosen. Virginia Beach, one of the most attractive and best patronized resorts on the coast, is 18 miles east of Norfolk and has a beach that is unsurpassed in the country. The Norfolk & Southern Railroad Company was chartered on April 28, 1910, as successor to the Norfolk & Southern Railway. It operates over 600 miles of track, of which about 48 miles, between Norfolk, Cape Henry and Virginia Beach, are equipped for electrical operation. In May, 1910, its electrical rolling stock consisted of 18 motor passenger cars, 14 trail passenger cars, 5 freight cars and 2 electric freight engines.

The principal dimensions of these cars are:

Length of body	36 ft. 0 in.
Length over platforms	45 ft. 5 in.
Length of platforms	4 ft. 3½ in.
Length of smoking comp't	8 ft. 8 in.
Centers of side posts	2 ft. 8 in.
Width over sills	8 ft. 6 in.
Width over posts	8 ft. 6 in.
Extreme width	8 ft. 9⅜ in.
From track to side sills	2 ft. 11⅜ in.
From side sills over trolley boards	9 ft. $4\frac{11}{16}$ in.
From floor to headlining	8 ft. 5 in.

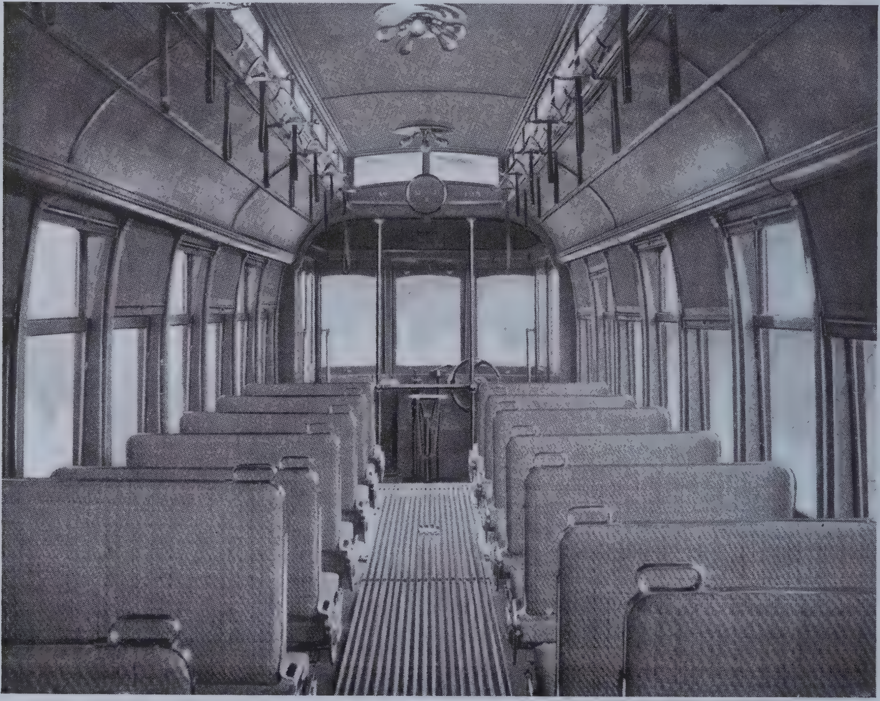
From track to step	0 ft. 18⅝ in.
From step to platform	0 ft. 15½ in.
From platform to floor	0 ft. 8⅛ in.
Seating capacity	52
Type of trucks	27-M. C. B. 1
Wheel base	6 ft. 6 in.
Diameter of wheels	0 ft. 34 in.
Size of journal	0 ft. 4¼ in.

Type of motors	GE-205—2-75 h.p.
Wt. of car, less elec. equip.	22,500 lbs.
Wt. of electrical equip.	2,800 lbs.
Wt. of air brake equip.	1,900 lbs.
Wt. of trucks	16,000 lbs.
Wt. of motors	7,200 lbs.
Total weight	50,400 lbs.

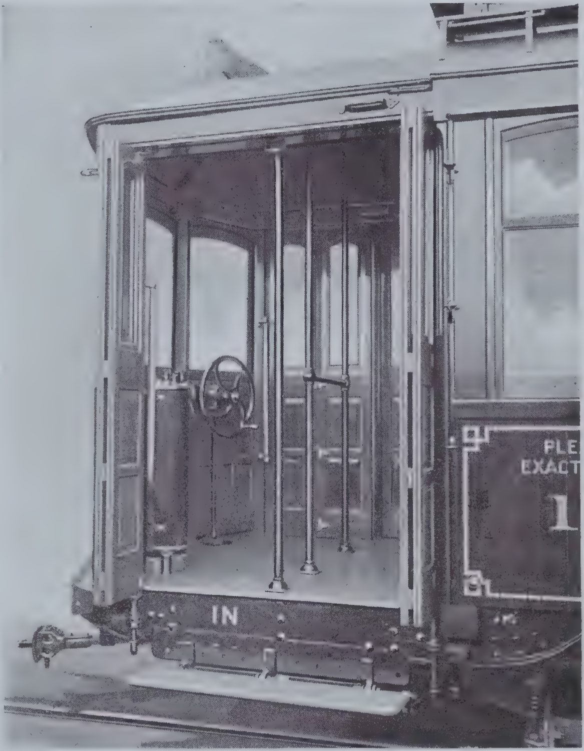
PAY-WITHIN CARS FOR BEAUMONT, TEX.

BRILL SEMI-CONVERTIBLE WINDOW SYSTEM

A NUMBER of Pay-Within cars, built by the American Car Company, have recently been added to the equipment of the Beaumont Traction Company. As is seen in the accompanying illustration, this car provides for

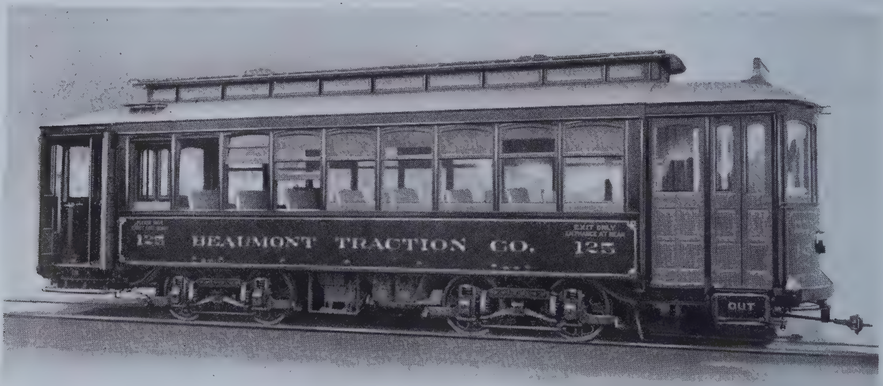


PAY-WITHIN CARS FOR BEAUMONT, TEX. The bulkheads are omitted, as is usual in the Pay-Within type. Seating capacity, 36



Pay-Within Cars for Beaumont, Tex. The folding doors and step are operated simultaneously by compressed air with controlling handle on a standard located on the platform near the end sill

entrance at the rear and exit in front, with folding doors and steps, which are operated simultaneously by air. The interior is finished in oak and the seats are upholstered in cane and have corner grab handles. A horizontal railing between a pair of stanchions separates the platform into a position for the conductor and a passageway for entering and leaving passengers. The conductor collects fares over this railing and opens and closes the doors from a standard having an operating handle and located on the platform near the end sill. The conductor faces toward the rear, and when operating the door turns and moves the handles with his left hand. His position enables him to bar the exit with his left arm if necessary. It is not intended to use this rear exit except when the car is crowded, as it will be the endeavor to have passengers move to the forward end and leave by the front door. The word "exit" is therefore omitted at the rear platform. Passengers are permitted to enter at both sides of the stanchion at the rear platform at congested traffic points if necessary to expedite loading.



PAY-WITHIN CARS FOR BEAUMONT, TEX. Large double-sash windows raise into pockets in the side roofs. The cars are mounted on Brill No. 27-G1 Trucks

The Beaumont Traction Company in May, 1910, operated 12 miles of track with an equipment of 20 motor cars. The city of Beaumont has a population of about 25,000 and is located at the center of the principal Texas oil fields.

The principal dimensions of this car are:

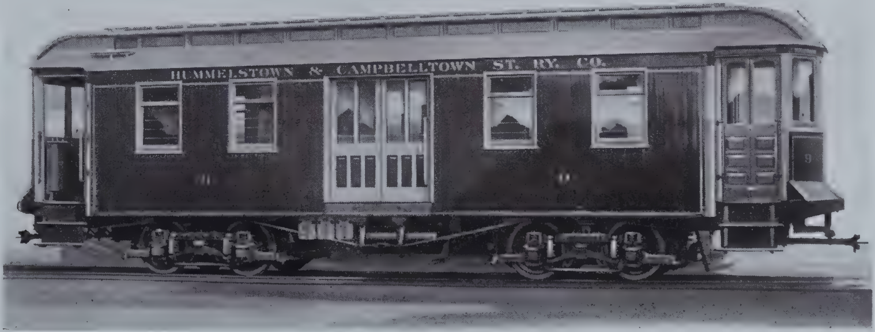
Length of body	25 ft. 4 in.
Length over platforms	37 ft. 4 in.
Length of platforms	6 ft. 0 in.
Centers of side posts	2 ft. 8 in.
Width over sills	8 ft. 2 in.
Width over posts	8 ft. 2 in.
Extreme width	9 ft. 0 in.
From side sills over trolley boards	9 ft. $6\frac{9}{16}$ in.
From track to side sills	2 ft. $9\frac{1}{16}$ in.
From floor to headlining	8 ft. 4½ in.
From track to step tread	0 ft. $16\frac{1}{16}$ in.
From step tread to platform	0 ft. 14½ in.
From platform to car floor	0 ft. 9⅝ in.
Seating capacity	36
Type of trucks	Brill 27-G1
Motors	GE-67

FREIGHT AND PASSENGER CAR

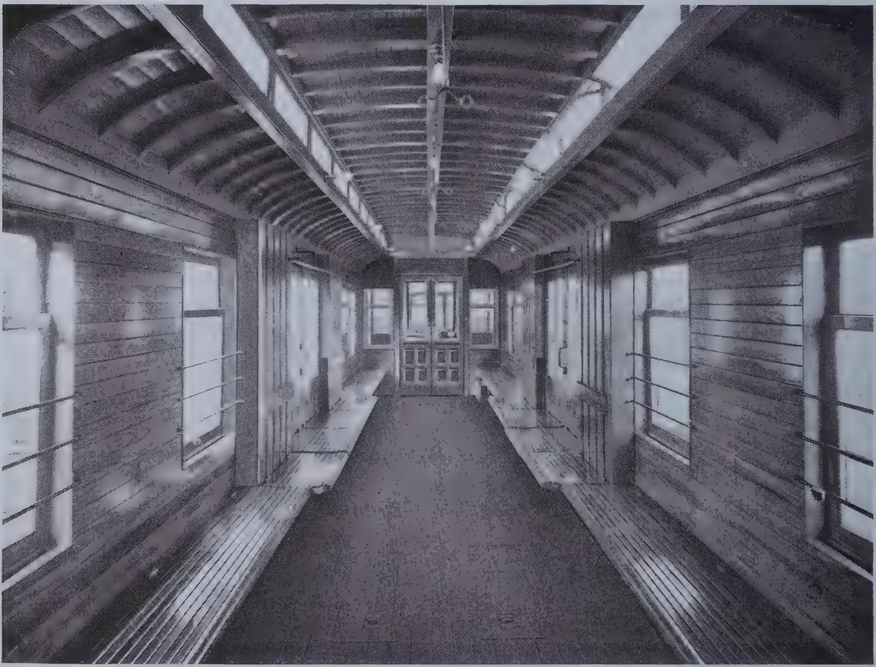
PLATFORMS AND CONTINUOUS FOLDING SEATS

AN interesting type of baggage and express car built by The J. G. Brill Company has recently been put into service by the Hummelstown & Campbelltown Street Railway. The design of this car is particularly well adapted to conditions in the section which this line traverses. It is a dairy farming district from which the various towns along the route of this railway obtain their supply of milk. From this district also is derived the large supply of milk required in the well known chocolate manufacturing industry of Hershey, one of the towns reached by this line. However, this district has also a large and increasing industrial population, which, together with other conditions mentioned, indicates the utility of this particular design of car.

As will be noted on the accompanying illustrations, this car has vestibuled platforms and bulkheads at both ends, which is a departure from the usual design of baggage and express cars. This construction well adapts the car for use as a smoker or for a special workingmen's car. The platforms are level with the car floor and double steps are therefore provided. Seating accommodation for passengers has been provided by continuous folding benches along both sides. These seats are of the longitudinal variety, and when not in use may be folded against the walls. A novel feature in their arrangement is the fact that the space occupied by the sliding side doors is also utilized for seating passengers by hinging folding seats thereto, which, when folded, slide with the doors into door pockets. There is a bulkhead in which there are mutually operating sliding doors at each end of the car, sepa-



Freight and Passenger Car. End entrances and folding seats equip this car for passenger service when not employed in carrying freight. Mounted on Brill No. 27-G1 Trucks



FREIGHT AND PASSENGER CAR. The seating capacity is 48. The seats against the sliding side doors are hinged and fold up like the rest, the door pockets being large enough to admit them

rating the platforms from the interior. From the interior arrangement of this car it will be seen that it may be used to transport workingmen to and from their places of employment and to carry baggage and freight.

The principal dimensions and weights of this type of car are as follows:

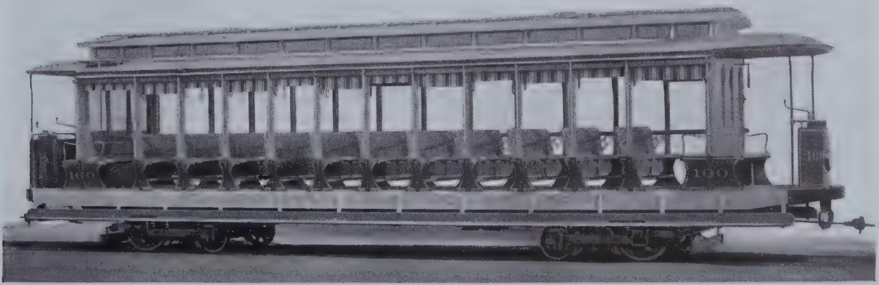
Length of body	31 ft. 0 in.
Length over platforms	41 ft. 8 in.
Length of platforms	5 ft. 4 in.
Centers of side posts	2 ft. 6 in.
Width over sills	8 ft. 2 in.
Width over posts	8 ft. 2 in.
Extreme width	8 ft. 3¾ in.
From track to sills	2 ft. 9⅜ in.
From sills over trolley boards	9 ft. 7⅝ in.
From floor to headlining	8 ft. 6¼ in.
From track to step	16¼ in.
Two steps to platform, each	12½ in.
Seating capacity	48

Type of trucks	Brill No. 27-G1
Wheel base	4 ft. 6 in.
Diameter of wheels	2 ft. 9 in.
Size of journal	3¾ in.
Motors	West. 101 B-2—4-40 h.p.
Wt. of car body less electrical equipment	16,500 lbs.
Wt. of electrical equipment	1,580 lbs.
Wt. of air brake equipment	2,600 lbs.
Wt. of trucks	12,000 lbs.
Wt. of motors	10,920 lbs.
Total weight	43,600 lbs.

LARGE OPEN CARS FOR ASBURY PARK, N. J.

BRILL 22-E TRUCKS

THREE 15-bench open cars, built by The J. G. Brill Company, were delivered early this season to the Atlantic Coast Electric Railway for service in Asbury Park and vicinity. These new cars are uniform in design and construction with the majority of the open cars now in service over the lines, the car bodies of which were manufactured by the John Stephenson Company. When it is considered that the permanent population of Asbury Park is but 5,000 and the summer population exceeds 100,000 annually, the conditions which have called for this type of car are easily understood. In addition to this large population in Asbury Park must be considered also the summer population of the nearby resorts of Long Branch, Elberon, Deal, Allenhurst, Bradley Beach, Neptune City, Avon, Belmar and Spring Lake, points on the route of the Atlantic Coast Electric Railway. A very favorable operating condition is in the fact that there is not a single grade in the entire railway system, as the land on which these towns are



Large Open Cars for Asbury Park, N. J. 15-bench car with seating capacity of 75. Mounted on Brill No. 22-E Trucks built is singularly level. This permits large capacity cars to be carried on single-motor trucks equipped with motors of only 35 h. p. each.

These cars are mounted on single-motor trucks of the Brill 22-E type. The Brill patented round-corner seat-end panels contain curtain grooves which continue the post grooves, thereby permitting the curtains to be drawn to the floor as well as strengthening the side posts at these points. The ceilings are of 3-ply bird's-eye maple veneer. The bottom framing has 4¾-in. by 7¾-in. side sills plated on the outside with 10-in. by ⅝-in. steel, and the upper structure has bulkhead posts 3⅝-in. and side posts 2¾-in. in thickness. Guard rails which slide between the posts and grab handles on each side of the car are made in two sections, and when raised are held under the water board by gravity catches.

In addition to these open cars, The J .G. Brill Company is now delivering to the same company three 28-ft. vestibuled closed cars of standard design. These cars are mounted on Brill 27-G1 trucks and have transverse seats of the "Winner" type, with the usual longitudinal corner seats, providing a seating capacity of 40 persons. Each car has double-sash windows, with the upper sash stationary; the lower sash can be dropped into pockets in the side walls. These cars are also uniform in design with others now in service on this company's lines.

The principal dimensions and weights of the open cars are as follows:

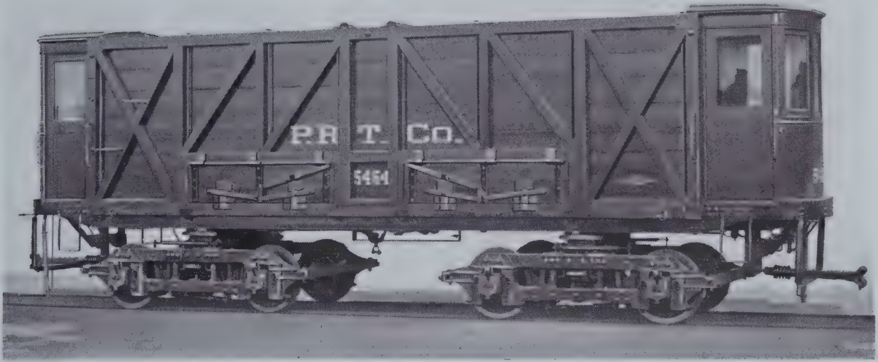
Length of body	34 ft. 4 in.
Length of platforms	4 ft. $5\frac{13}{16}$ in.
Centers of side posts	2 ft. 7 in.
Width over sills	6 ft. 7⅞ in.
Width over posts	7 ft. 3 in.
From track to step	20⅛ in.
From step to floor	17 in.
Seating capacity	75
Type of trucks	Brill No. 22-E

Wheel base	4 ft. 0 in.
Diameter of wheels	33 in. and 20 in.
Motors	GE-67—2-35 h.p.
Wt. of car less elec. equip.	13,140 lbs.
Wt. of electrical equipment	880 lbs.
Wt. of trucks	7,480 lbs.
Wt. of motors	4,200 lbs.
Total weight	25,700 lbs.

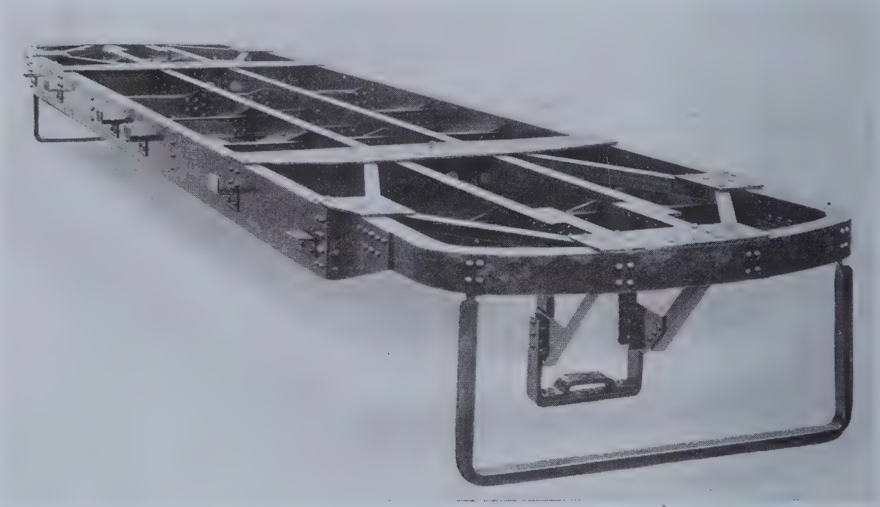
COAL CARS FOR PHILADELPHIA RAPID TRANSIT COMPANY

STEEL UNDERFRAMES

THE engraving shows one of four coal cars mounted on motor trucks, lately delivered to the Philadelphia Rapid Transit Company. The center and the side sills are 12-in. channels and the side sills have 3¾ by 5¾-in. yellow pine sub-sills extending the full length of the channel on the outside and supported on the channel by Z-shape brackets 7½-in. wide by $\frac{5}{16}$-in. thick, six on each side. The crossings consist of 5-in. channels set between the side and intermediate sills and connected to each sill with 3 by 3 by ⅜-in. angles. At each end of the car, beyond the bolster and extending from bolster to cross-tie and from cross-tie to end of center sills, are diagonal braces made of 2½ by 2½ by ¼-in. angles secured by steel gusset plates. The bolsters are built up of ½-in. steel web plates with 3½ by 3½ by $\frac{5}{16}$-in. top and bottom flange angles on each side of



Coal Cars for Philadelphia Rapid Transit Company. These powerfully built cars have steel underframes and have a capacity of 37½ cubic yards web. The bolster plates are connected to the center sills by 4 by 4 by ⅜-in. angles and to the side sills by 3½ by 3½ by ⅜-in. angles securely riveted. The bolster top plate is 20 by ⅜-in. steel and the bottom plate 12 by ½-in. A malleable filler casting is placed between the center sills at the bolster, and the body side bearings are each built up of two malleable iron braces, one on each side of the web, to which is attached the curved malleable iron wear plate. The bumpers are made of 6 by 4 by ⅜-in. angles, bent to shape in one piece and extending back to the side sills to which they are secured with 12 by ½-in. steel plates.



COAL CARS FOR PHILADELPHIA RAPID TRANSIT COMPANY. The brackets on the side sills support yellow pine sub-sills

The principal dimensions and weights of these cars are as follows:

Length of body	25 ft. 6 in.
Length over platforms	33 ft. 6 in.
Length of platforms	4 ft. 0 in.
Width over posts	7 ft. 5¾ in.
From track to sills	3 ft. 0 in.
From sills over trolley boards	8 ft. 0 in.
Capacity	37½ cu. yds.
Wheel base of each truck	6 ft. 4 in.

Motors	GE-80—4-40 h.p.
Wt. of car body less elec. equipment	16,180 lbs.
Wt. electrical equipment	1,250 lbs.
Wt. of air brake equipment	1,500 lbs.
Wt. of trucks	20,000 lbs.
Wt. of motors	11,500 lbs.
Total weight	50,430 lbs.

BRILL No.

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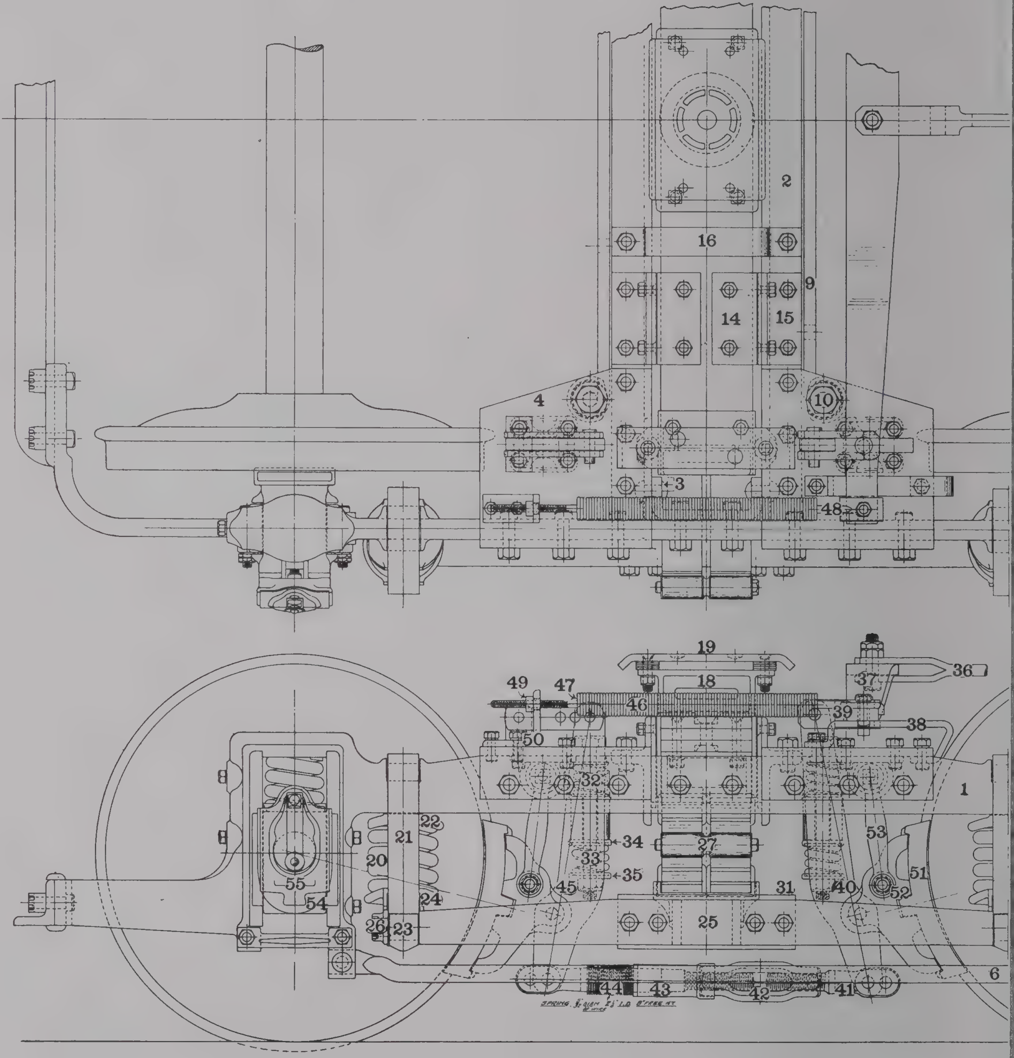

Names of Parts

1 Side Frame
2 Transom
3 Transom Corner Bracket
4 Transom Gusset Plate
5 End Frame
6 Pedestal Tie Bar
7 Pedestal Cap
8 Pedestal Gib or Wear Plate
9 Motor Suspension Bar
10 Motor Suspension Bar Bolt
11 Bolster Top Plate
12 Bolster Bottom Plate
13 Bolster Filling Casting
14 Bolster Chafing Plate

15 Transom Chafing Plate
16 Transom Tie Bar
17 Truck Center Plate
18 Side Bearing
19 Side Bearing Wear Plate
20 Equalizer Spring
21 Equalizer Spring Link
22 Equalizer Spring Cap
23 Equalizer Spring Eye-Bolt
24 Equalizer Spring Seat
25 Equalizer or Equalizer Bar
26 Equalizer Nut
27 Bolster Spring
28 Bolster Spring Seat

7-E TRUCK
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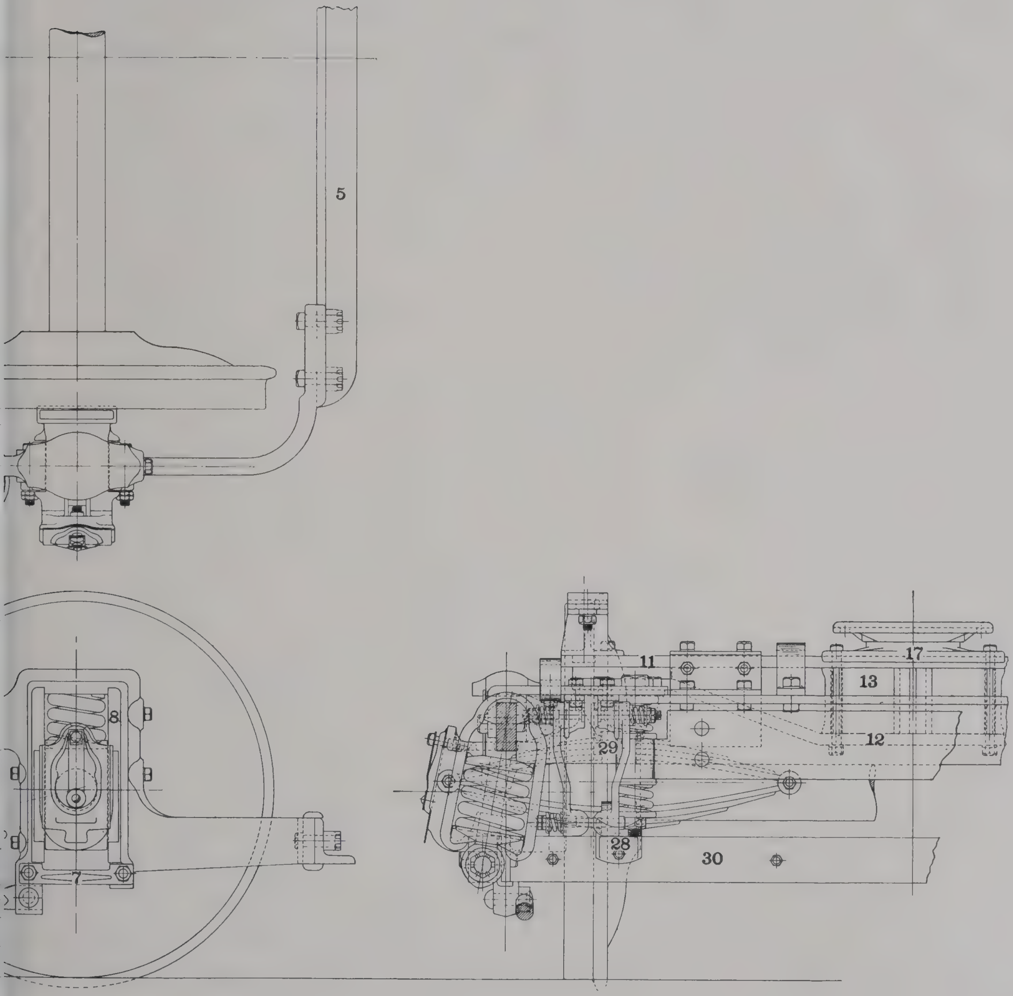

29 Bolster Spring Cap
30 Spring Plank
31 Spring Plank Carrier
32 Motor Suspension Spring (Top)
33 Motor Suspension Spring (Bottom)
34 Motor Suspension Spring Cap
35 Motor Suspension Spring Seat
36 Brake Rod
37 Radius Bar
38 Radius Bar Guide
39 Radius Bar Clevis
40 Live Lever
41 Brake Turnbuckle End
42 Brake Turnbuckle
43 Brake Turnbuckle Lock
44 Brake Turnbuckle Lock Spring
45 Dead Lever
46 Brake Release Spring
47 Brake Release Spring Casting (location indicated)
48 Brake Release Spring Hook Bolt
49 Brake Release Spring Nut
50 Brake Release Spring Clip
51 Brake Shoe
52 Brake Head
53 Brake Hanger
54 Journal Box
55 Journal Box Lid

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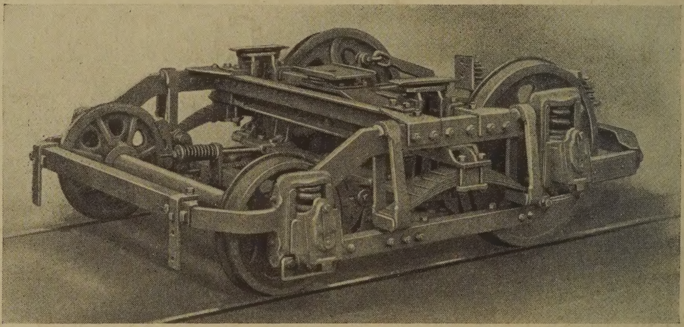
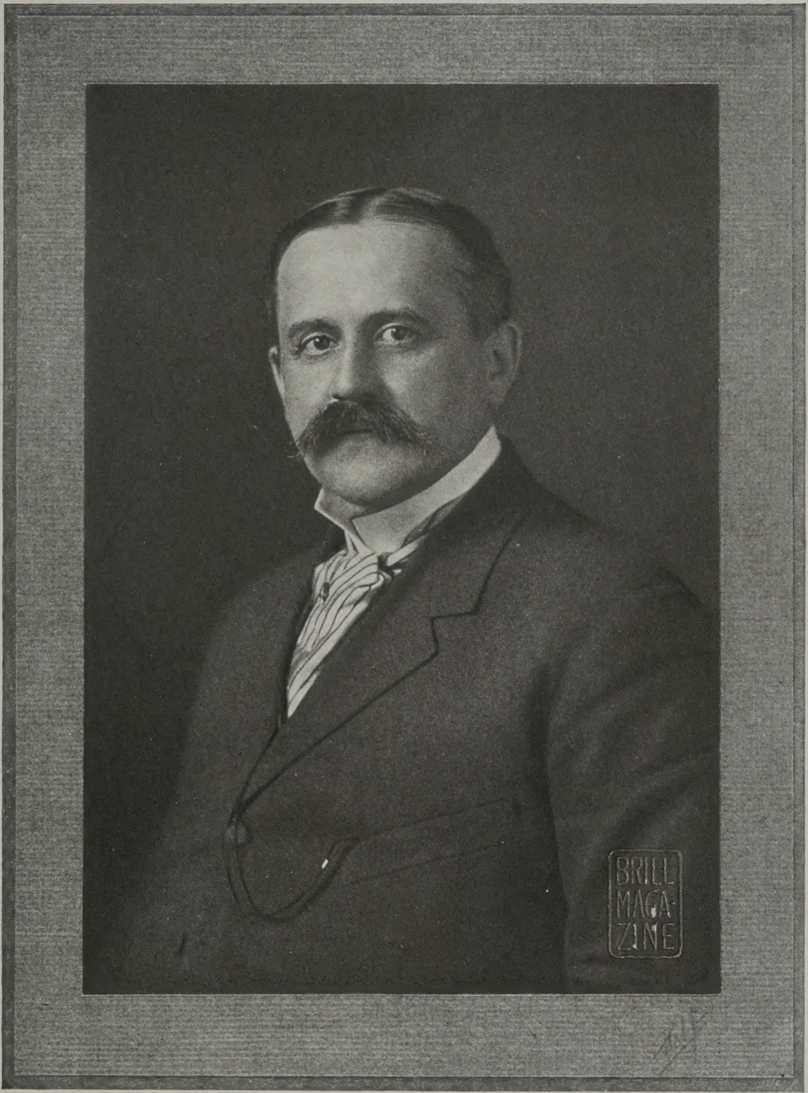


BRILL SINGLE-MOTOR
TRUCK No. 39-E

It would at least be interesting to know what reduction in weight could be made in your next lot of city cars and trucks over the last, and we would be glad to figure it out for you. Of course it would be on the basis of using the above truck, for not only is it the lightest bolster truck built but the single-motor feature is an enormous saving in weight and the wide truck centers permit a lighter body construction. One road recently made some changes in body design, put the cars on these trucks and saved 30 per cent. over the last lot of rolling stock. What about riding qualities and the pony wheels sticking to the track? The answers are in the fact that the truck has been in use for more than three years in New York (both Third Avenue, and Metropolitan), Brooklyn, Philadelphia, Washington (both Capital Traction and Washington Railway & Electric), Richmond and Denver, and it is now operated on 65 different roads. For economy in power plant investment, power consumption, maintenance of electrical equipment and rolling stock investment, consider the Brill Single-Motor Truck No. 39-E and write for figures in weight reduction.

THE J. G. BRILL COMPANY
PHILADELPHIA - - - PENNSYLVANIA



Jno Blair Macafee

President of the Norfolk & Portsmouth Traction Co., Central Kentucky Traction Co., Blue Grass Traction Co., The Lexington Railway Co., Pomeroy & Middleport Electric Co., Lexington Utilities Co., and Vice-President and General Manager of The Ohio River Electric Railway & Power Co.

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